1559137 COMPLETE SPECIFICATION

2 SHEETS *This drawing is a reproduction of the Original on a reduced scale*

Sheet 1

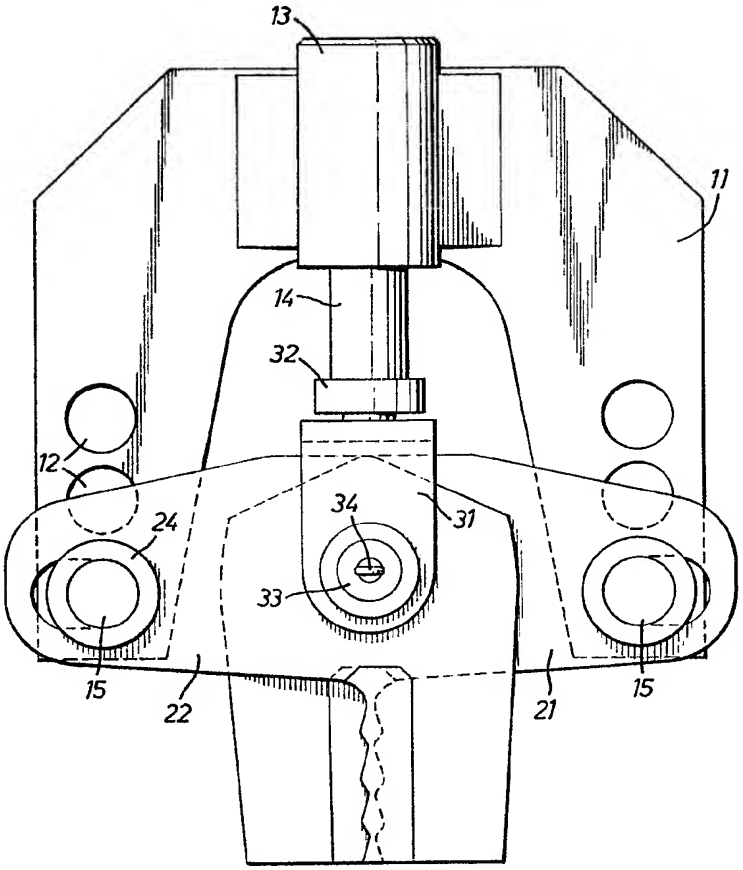

FIG.1

1559137 COMPLETE SPECIFICATION
2 SHEETS This drawing is a reproduction of the Original on a reduced scale
Sheet 2

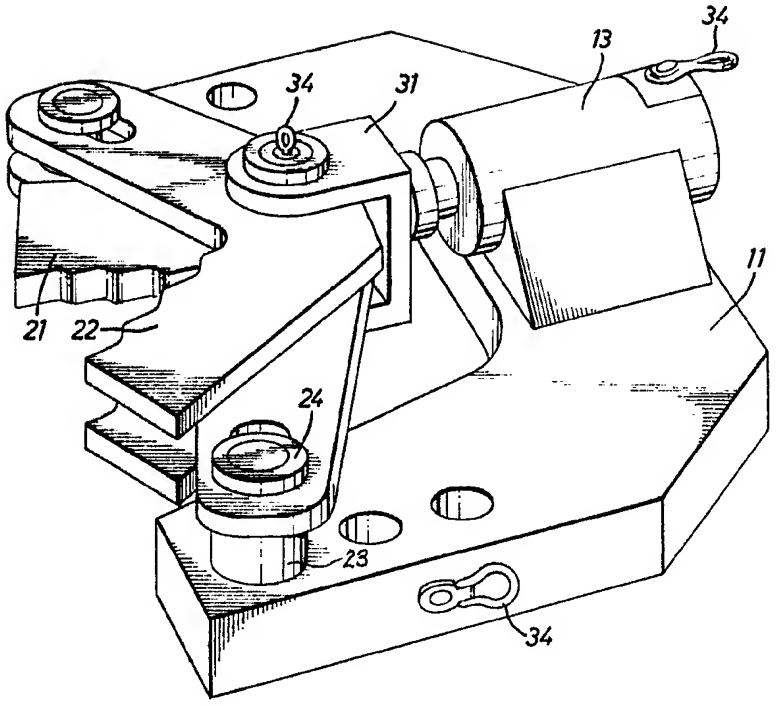

FIG. 2

PATENT SPECIFICATION (11) 1 559 137

1 559 137

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(54) HYDRAULIC SHEARS

(71) I, FRANK VALORI of Sunbridge Avenue, Bromley, Kent, of Italian nationality, do hereby declare the invention, for which I pray that a patent may be granted to me, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to an improvement in the hydraulic crushing unit described in my earlier patent application 33923/73 (Serial No. 1,421,973). Such a unit is useful in breaking up structural elements such as walls, beams, columns and floors and concrete cased structural steel members, and is suspended in the appropriate orientation accordingly. When the elements are of reinforced concrete construction, the crushing will probably crack the concrete from the reinforcing bars or prestressing wires or steel sections, but the crushing may only be sufficient to bend the reinforcing bars, etc. without completely demolishing the reinforcing frame. It is an object of the present invention to provide an addition to the unit of the earlier application which will complete the demolition by shearing the reinforcing bars and other shearable elements which have not been completely demolished by the action of the original crushing unit.

In my earlier application I have described and claimed a hydraulic crushing unit comprising a frame, at least two jaws mounted on the frame, a hydraulic piston and cylinder unit mounted on the frame for moving one jaw relative to the other jaw or jaws to crush an article between them, and means for attachingthe frame to lifting cables, According to the present invention this crushing unit is improved by the addition of a self contained shearing unit mounted on the frame and actuatable by said hydraulic piston and cylinder unit.

The shears may be removably mounted on the frame, preferably on a pair of stationary jaws themselves mounted on the frame, and the shears can be removably connected to the hydraulic piston and cylinder unit. Thus the piston and cylinder unit can move the one jaw relative to the other jaws to crush an article between them and then the shears can be connected to the piston and cylinder unit carrying out a shearing action under the drive of the piston and cylinder unit.

An example of the invention will now be described with reference to the accompanying drawings, in which:—

Figure 1 is a plan view of hydraulic shears mounted on a crushing unit, the shears being in the closed position, and

Figure 2 is a perspective view of the shears mounted on the crushing unit, the shears being in the open position.

Of the components shown in Figure 1, the main crushing unit comprises a U-shaped frame 11, with three holes 12 arranged along the length of each arm of the U towards its free end. At the center of the frame there is the main piston and cylinder unit 13, whose piston 14 is extendable symmetrically between the arms of the frame. A post 15 is mounted in one hole 12 of each arm of the frame 11 to provide a symmetrical arrangement, and the apparatus operates to crush an article by forcing one jaw formed by the end of the piston 14 against one side of the article, while the opposite side is restrained by the posts 15 in the holes 12.

The crushing unit thus far described which is the subject of the earlier application 33923/73 is modified by the provision of shear blades 21 and 22 on the posts 15. As can be better seen in Figure 2, the blade 21 is a single blade and is mounted on the post 15 spaced from the frame 11 by a spacing sleeve 23 and is retained in position by a retaining ring 24. The blade 22 is a double blade, having one element on either side of the blade 21 so that articles between

the jaws of the blades 21 and 22 will not be twisted by the shearing action. The blade 22 is similarly mounted on its post 15.

A holding bracket 31 is removably mounted by a suitable adaptor 32 onto the jaw end of the piston 14 and carries a pivot shaft 33 which passes through both blades 21 and 22. The blades 21 and 22 are L-shaped, the shaft 33 passing through the join of their two arms, the arm of each blade remote from the post 15 having a serrated face to assist gripping and shearing of the article. It will be seen from Figure 2 that the ends of the blades 21 and 22 adjacent the posts 15 are slotted to accommodate the change in distance between the shaft 33 and the posts 15 as the piston 14 is advanced.

The blades 21 and 22 together with shaft 33, bracket 31 and adaptor 32 from a permanent assembly which is lifted on or off the crushing machine as a single unit.

As is described in my earlier specification, the frame 11 of the crushing unit is suspended in the appropriate orientation by lifting cables (not shown) attached to selected one of lifting eyes 34 which in Figure 2 are shown in position on the side of an arm of the frame 11, on the piston and cylinder unit 13, and on the upper end of the shaft 33. Other lifting eyes may be added where required. During the crushing action, the shearing assembly of blades 21 and 22 bracket 31 and adaptor 32 is disconnected from the piston 14 and removed from the frame 11 altogether.

After the crushing action has finished, the bracket 31 is mounted by means of the adaptor 32 on the end of the piston 14, and the blades 21 and 22 mounted on the respective posts 15. The apparatus, so modified, is now suspended in the appropriate orientation to grip the remaining articles between the faces of the blades 21 and 22 and the piston 14 extended from the unit 13 to bring the serrated faces of the blades 21 and 22 together as shown in Figure 1 to shear the remaining articles. It is envisaged that the shears will have sufficient strength to shear a 24 inch girder after the surrounding concrete has been crushed off it by the crushing action between the piston 14 and the posts 15.

WHAT I CLAIM IS:—

1. A hydraulic crushing unit comprising a frame, at least two jaws mounted on the frame, a hydraulic piston and cylinder unit mounted on the frame for moving one jaw relative to the other or jaws to crush an article between them, means for attaching the frame to lifting cables and a self-contained shearing unit mounted on the frame and actuatable by said hydraulic piston and cylinder unit.

2. A crushing unit as claimed in claim 1 wherein said shearing unit is removably mounted on the frame.

3. A crushing unit as claimed in claim 2 wherein said shearing unit is removably mounted on said frame by means of a pair of said jaws which are stationarily mounted on the frame.

4. A crushing unit as claimed in any one of claims 1 to 3 wherein said searing unit comprises a pair of L-shaped members pivoted together at the junction of their arms, the end regions of one arm of respective members being restrained on said frame such that movement of the pivot axis of said members by said piston and cylinder unit in one direction will cause the other arms of the respective members to close together to shear an object placed between them.

5. A crushing unit as claimed in claim 4 wherein one of said L-shaped member is formed with two spaced elements, the other of said L-shaped members lying between said elements.

6. A crushing unit as claimed in claim 4 or claim 5 wherein the piston of the piston and cylinder unit is connected to the common pivot axis of the L-shaped members by a bracket to which the piston is removably connected to move said common pivot axis relative to said frame.

7. A crushing unit as claimed in any one of the preceding claims wherein the frame is provided with a plurality of mounting recesses for the jaw or jaws which is or are stationarily mounted on the frame, said jaw or jaws being mounted in a respective selected recess.

8. A method of breaking a body into pieces comprising crushing the body by moving one jaw relative to one or more other jaws by means of a hydraulic piston and cylinder unit, and then shearing pieces from said crushed body by means of a shearing unit operated by said hydraulic piston cylinder unit.

9. A hydraulic crushing unit substantially as hereinbefore described with reference to and as illustrated in the accompanying drawings.

10. A method of braking a body into pieces substantially as hereinbefore described with reference to the accompanying drawings.

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